United States Department of the Interior

U. S. GEOLOGICAL SURVEY
John W. Powell Federal Building
12201 Sunrise Valley Drive
Reston, VA 20192

PEER REVIEW PLAN[1]

Date: June 2, 2005

Source Center: U.S. Geological Survey
Wisconsin Water Science Center
8505 Research Way
Middleton, Wisconsin 53562-3581

Preliminary Title: Land and Air Management Impacts on Methylmercury Contamination of the Everglades

Subject and Purpose: Methylmercury is a potent neurotoxin that can potentially have population level impacts. The presence of methylmercury in the environment has several unique aspects that make it especially interesting from an ecosystem management perspective. First, methylmercury results from the post-deposition transformation of atmospheric mercury to methylmercury once in an aquatic environment. This conversion occurs through natural processes, which vary strongly among ecosystem types and are exacerbated by co-factors such as sulfate additions. Thus, the level of methylmercury in any particular ecosystem is regulated by a number of natural (ecosystem type, water chemistry) and man-related (mercury and sulfate loading rates, changes to hydrology) factors. In the case of the Everglades, planned and ongoing ecosystem restoration efforts have resulted in substantial changes to water chemistry and flows, which have profound effects on methylmercury levels. In addition, increases in the periodicity of wetting and drying cycles have a direct correspondence with pulses in methylmercury formation. Thus, changes in the hydrology of the Everglades will have a direct effect on methylmercury levels. Results from this study demonstrate that sulfate, an essential constituent in the mercury methylation process, has decreased significantly (>90%) in some areas of the Everglades over the past five to ten years due to changes in land use and water routing. In those areas where sulfate declines have occurred, similar large decreases in methylmercury concentration in surface water have also resulted. Over the same time period, however, atmospheric mercury deposition rates in south Florida have

[1] USGS Peer Review Plans consist of two standard parts. The first addresses questions listed in OMB's Final Information Quality Bulletin on Peer Review—Section V. Peer Review Planning (December 15, 2004). The second is the policy-directed process used by USGS to address all information products for which peer review is required.

decreased due to local source control measures, and thus are partly responsible for the observed declines as well. These results demonstrate how an environmental contaminant such as methylmercury arises from the complex interactions of factors affecting air, water and land management, and the need for holistic scientific understanding to prescribe sound and effective solutions.

Agency Contact Person: **Ronald E. Kirby, Ph.D.**
Science Quality Coordinator
peer_review_agenda@usgs.gov

This product is potentially "Influential Scientific Information" in the sense of OMB's Final Information Quality Bulletin for Peer Review unless the box below is checked.

This product is considered a "Highly Influential Scientific Assessment" in the sense of OMB's Final information Quality Bulletin for Peer Review: [X]

What is the timing of the peer review; will deferrals be considered?

September-October 2005

Deferrals are not anticipated at this time.

Will alternative procedures be applied? Yes ___ No _X_

How will the review be conducted? Panel ___ Individual letters _X_ An alternative procedure

Will there be opportunities for the public to comment on the product and if so, how and when?

Yes, after the peer review and publication process. The intended outlet for this report is a scientific peer-reviewed journal (most likely Environmental Science and Technology), and as such, the public is always welcome to submit responses to the editor of the journal.

Yes _X_ No ___

Written correspondence _X__
Oral presentation to peer reviewers ___

Before peer review ___
During peer review ___
After peer review _X__

Will significant and relevant comments from the public be provided to the peer reviewers before they conduct their review? Yes ___ No _X__

What is the anticipated number of reviewers? **3 or fewer** _X_
4-10 ___
>10 ___

What are the primary disciplines or expertise needed in the peer review?

Environmental chemistry and microbial ecology

Reviewers will be selected by USGS _ X _ A designated outside organization ___

Will the public be asked to nominate potential peer reviewers? Yes ___No _ X _

Will scientific or professional societies be asked to nominate peer reviewers? Yes ___ No _ X _

(However, this paper will be submitted to a scientific journal where additional independent peer reviewers will be selected.)

THE STANDARD USGS PEER REVIEW PROCESS[2]

1. Responsibilities at the Science Center Level. Science Center Managers (or their equivalent, depending upon organizational structure) are responsible for ensuring peer review of all USGS research or interpretive products. They ensure that appropriate numbers of independent reviewers are utilized, that there are no conflicts of interest, and that authors responded appropriately to the peer review comments. Except for those for which they have delegated policy-approving authority, they ensure that all peer-reviewed products are forwarded along with drafts, peer review comments, responses of authors, and revised drafts to the Approving Official for policy review. They confirm with this forwarding that these actions have occurred and with their signature that the product meets the Science Center's standards for overall quality. They also ensure maintenance

[2] The process described applies to all peer reviews in U.S. Geological Survey with the addition that the final peer review reports of Influential Scientific Information and Highly Influential Scientific Assessments (as well as all materials related to such peer reviews) are disseminated on the USGS Web site per OMB's Final Information Quality Bulletin for Peer Review, Sections II and III.

of records of all transactions related to the planning, conduct, review, and reporting of USGS science.

A. *Conducting USGS Peer Reviews.* USGS peer review is largely managed by and conducted within the USGS Science Centers, i.e., as close as possible to the location where the science was accomplished. The following steps, in the order given, comprise the USGS peer review process:

(1) *Initiating the Review.* A Responsible Official (a person administratively selected to be responsible for conduct of a peer review) establishes the objectives and structure of the review, the timeframe for review, selects the reviewers, provides review findings to authors, ensures that comments are adequately and fairly addressed, and ensures that proper records are maintained. Responsible Officials for review of products are in most cases the supervisors of the scientists conducting the work. Peer scientists or science managers in the same or another Science Center also may be Responsible Officials for review of products.

(2) *Selection of Reviewers*. Reviewers must be true peers, must be independent, must be without conflict of interest, and should be selected for their relevant scientific and technical expertise. They should represent a range of viewpoints on issues at hand. Scientists may nominate potential reviewers, but actual selection rests with the Responsible Official managing the review.

> (a) Independence of a peer reviewer means in its most narrow sense that the person was not involved in producing the product to be reviewed. This would include not directly contributing to the product's development or indirectly contributing by significant consultation during development or by supervising the personnel who conducted the work. However, some plans and products will benefit from applying more stringent criteria for independence and therefore exclusion of reviewers from the Science Center producing the work or perhaps from the entirety of USGS. Each situation requires a case-by-case analysis by the Responsible Official
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> (b) The Responsible Official must ensure that each potential reviewer has been asked to disclose any personal information or situation that may create the presence or the appearance of conflict of interest. In the context of peer review, conflict of interest is defined as any financial or other interest that conflicts with the service of an individual because it could impair the individual's objectivity or could create an unfair competitive advantage for a person or organization. Reviewers must be willing to disclose any potential conflicts of interest. Responses to queries regarding conflict of interest are recorded in the archival files of the plan or product under review.

(3) *Number of Reviewers.* Each scientific peer review must include at least two reviewers, and preferably three or more. A combination of internal (from the originating Science Center) and external (from outside the Science Center or USGS) reviewers may

be used depending upon the complexity of the plan or product and the projected audience.

(4) *Guidance to Reviewers.* The objectives of each peer review must be clearly defined in the form of questions the reviewers are expected to answer.

(5) *Disposition of Review Comments.* All review comments will be made available to the authors and along with author responses become part of the review package forwarded to the Approving Official prior to Bureau Approval.

(6) *Responding to Review Comments.* All review comments must be accepted or rejected for cause. The decisions by the authors must be recorded in a reconciliation document that becomes part of the archival file for the work at hand.

(7) *Record Keeping.* The Responsible Official must ensure that a written administrative record is maintained for all peer reviews. This will include at least the name and position of the Responsible Official; the name, affiliation, and pertinent qualification (technical expertise) of each reviewer; applicable conflict of interest documentation; all peer review comments; and the reconciliation documents following the authors' response to review. Records should be sufficient for an uninvolved person to understand the process and determine the changes made as a result of review.

B. *Reviewer Anonymity and Process Transparency.* USGS pursues a vigorous and open scientific review and debate of products. This is most easily accomplished when authors and reviewers directly interchange ideas and reviewers are not anonymous. Although there is a tradition of reviewer anonymity outside USGS, especially in peer review of products by professional journals, Responsible Officials have the authority to define the review process as one with identified or anonymous reviewers, with the former usually being the argument of choice. With regard to public disclosure of comments, OMB requirements supersede other concerns and at times both the names of reviewers and their comments must be made public, although not attributed to specific individuals. Whether reviewer identity will be revealed, even if only in a list of reviewers who participated in review, must be made clear in the guidance provided the reviewers. Following the review process, information about a reviewer retrieved from a record filed by the reviewer's name or other identifier may be disclosed only as permitted by conditions of disclosure enumerated in the Privacy Act, 5 U.S.C. § 552a, as amended and as interpreted in OMB implementing guidance 40 Fed. Reg. 28,948 (July 9, 1975) (OMB, Final Information Quality Bulletin for Peer Review; December 15, 2004).

C. *Costs.* The scientific community has historically interchanged scientific peer reviews at no cost. This is the model USGS will follow. There nonetheless may be unusual circumstances in which legitimate costs are incurred. These may be paid by the USGS.

D. *Validation of Peer Review.* Approving Officials validate the adequacy of scientific peer review as part of the Bureau Approval process for dissemination of information products.

2. Responsibilities of the Approving Official. The Approving Official validates compliance with USGS Scientific Peer Review guidelines. He/she confirms that appropriate numbers of independent internal and external reviewers were contacted, that reviews were objective, and that no conflicts of interest were incorporated. He/she confirms that authors responded to the peer review comments by including revisions or rejecting comments for cause.

A. *Approving Official's Checklist for Scientific Peer Review*. Use of a standard checklist facilitates review. This checklist is also suitable for Responsible Official and Managerial Review of the results of peer review within the Science Centers. If so used, it may be forwarded to the Approving Official as part of the package for policy review.

- Has the Science Center Manager (or equivalent) confirmed that the product meets the Science Center's standards for quality?
- Was the review conducted at an organizational level independent from that in which the product was planned and produced?
- Were reviews conducted by true scientific peers as judged by demonstrable scientific achievements and did those peers represent the major areas of expertise required to evaluate the product?
- Were the peer reviewers independent?
- Was lack of real or potential conflict of interest confirmed?
- Were there sufficient numbers of internal and external reviewers?
- Were appropriate USGS staff in the other regions and disciplines provided an opportunity to comment?
- Is Office of Communications and Outreach review advised?
- Were the reviewers objective?
- Was constructive feedback provided to the investigator(s)?
- Did the author(s) respond to all peer review comments?
- Is there a clean draft that incorporates the authors' decisions regarding the review comments and a reconciliation document addressing rejected advice?
- Does the new draft conform to the general standards of the outlet selected?

3. Correcting Peer Review Errors. The decision of the Approving Official is that peer review has been successfully accomplished per USGS standards or not. If it has not, the Approving Official contacts the Science Center Manager for additional information or returns the product for additional review. The Approving Official does not provide *ad hoc* additional peer review comments.

4. Review Following Validation of Peer Review. If the peer review is validated, the product is subjected to policy review.